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Submitted by the expert from Germany

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# **Truck drivers' turning information concept – a psychological approach**

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## Human factors' approach

- Drivers' task
  - steer and control with available information
  - primarily visual (ANDERSEN, 2011)
  - many decisions in short time span
  
- Humans make decisions very fast under uncertainty
  - by available information (TVERSKY & KAHNEMAN, 1974)
  - by representative information (memory involvement)



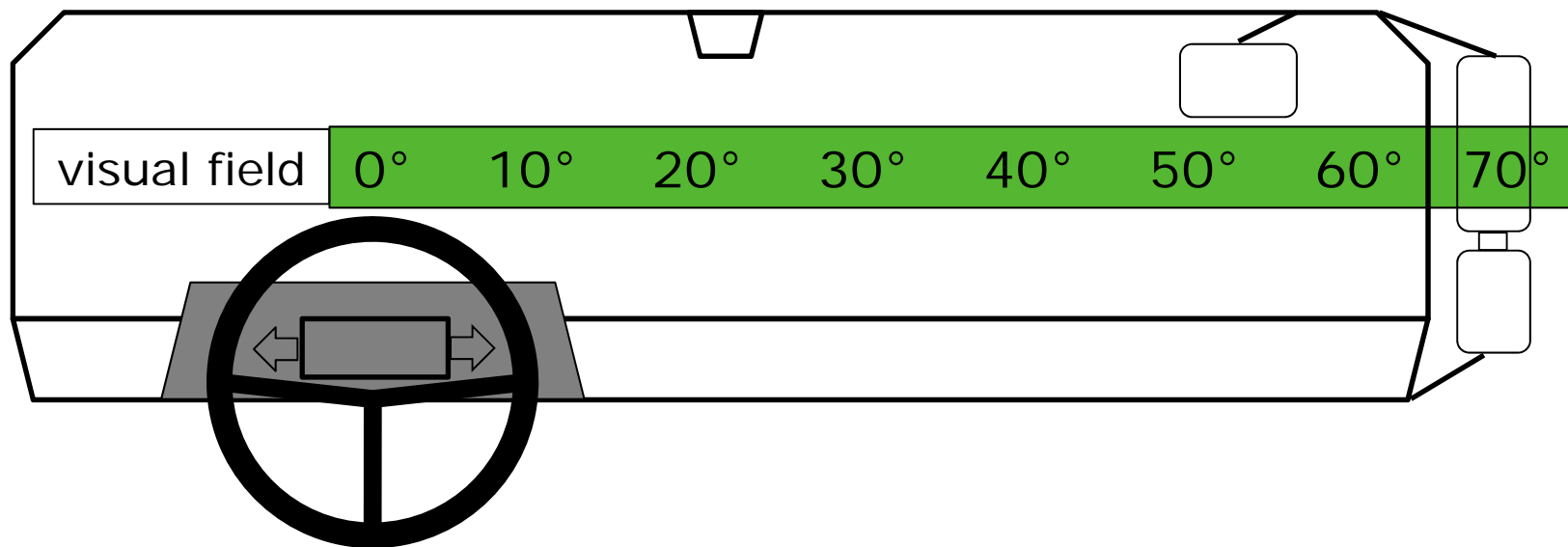
## Truck driving – the visual field



Driver's head and view turns in the direction of driving!



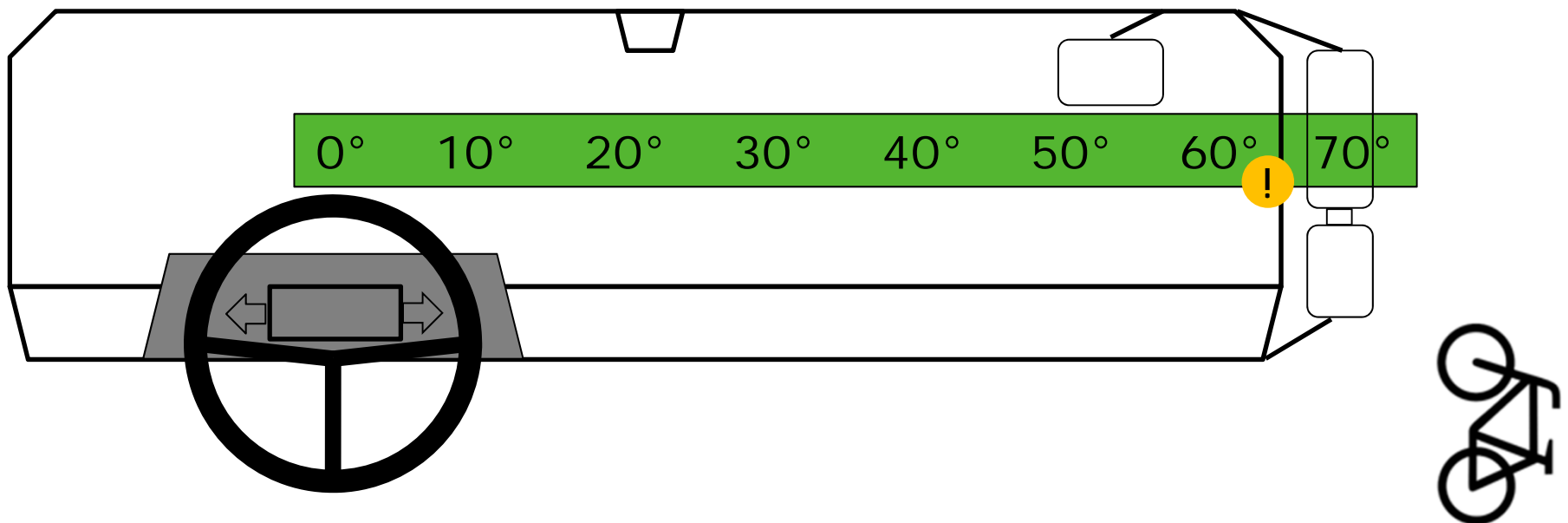
## Turning information concept



→ No accident prone situation



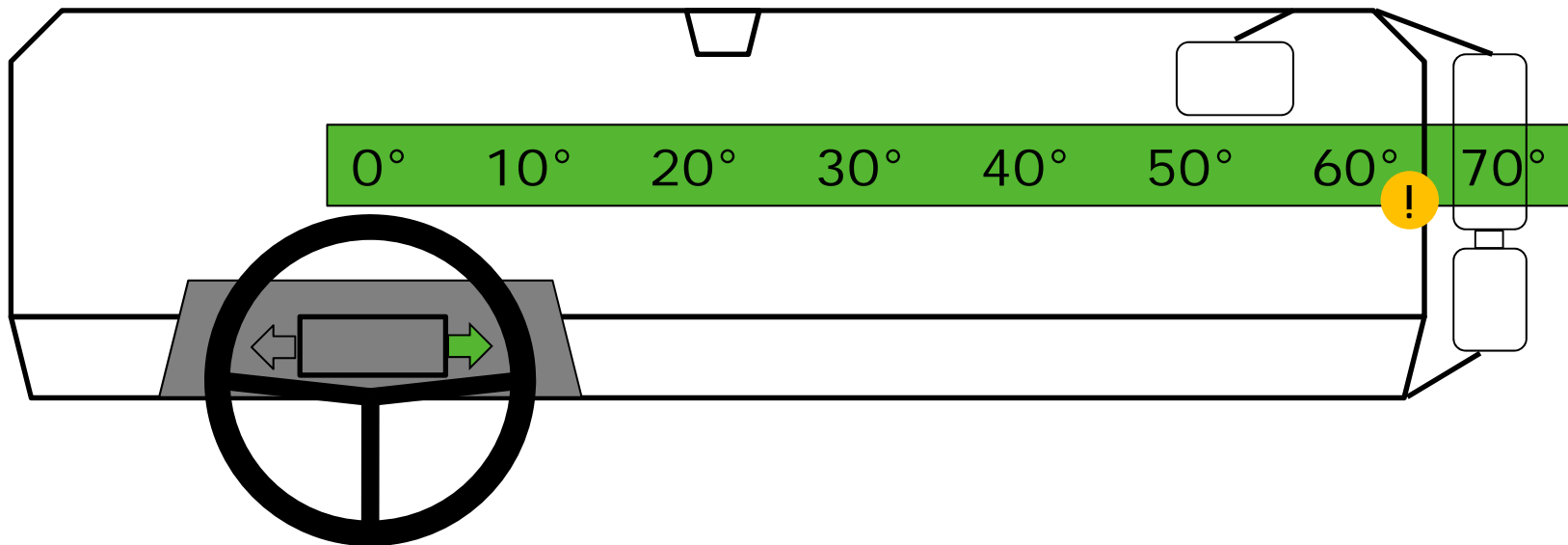
## Turning information concept



→ Driving straight ahead, blind spot detection



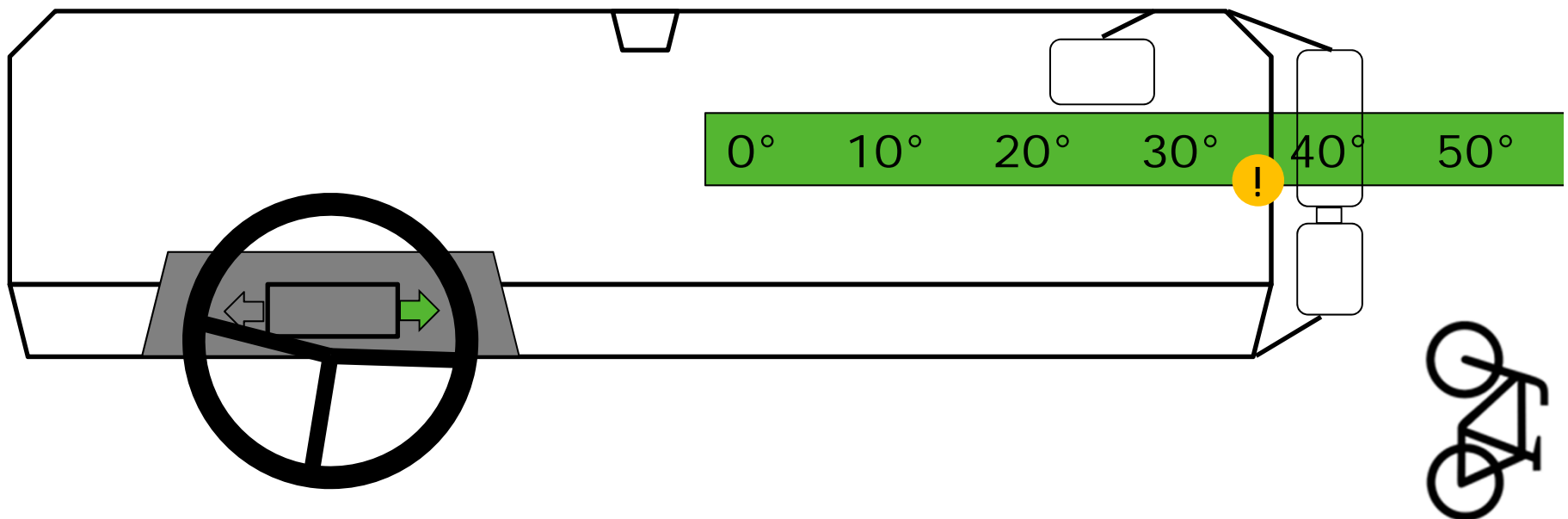
## Turning information concept



→ Driving straight ahead, preparing turning,  
(direction indicator maybe activated)



## Turning information concept



- Begin turning, direction indicator maybe activated,
- gaze perhaps into mirror's direction



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## Turning information concept

1. Support drivers with information!
2. Make perception possible!
3. Create attentional fixation! (WOGALTER, CONZOLA & SMITH-JACKSON, 2002)
4. Notice recommendations of design! (e.g. EN ISO 9241 [110])
5. Take situational aspects into account! (POWELLEIT ET AL., 2015)  
(e.g. accident prone situations)





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## What do we need?

We need a recognizable and  
interference-free information concept!



## Video (eye tracking)



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## How to avoid disturbance?

- No use of warnings in an early detection phase!
- Use of information!
- Well-balanced flashing (BALDWIN & LEWIS, 2013)
- 30° (around fixation) is most important for vehicle control!

(LACHENMAYR, 2006)



## Turning information concept

The balance between recognizable  
and interference-free is the key!

- ➔ You can achieve it!
  - ...using the periphery
  - ...using human's gaze movement
  
- ➔ Display blind spot information!



## Turning information concept

- Display blind-spot information!
  - Stamp out the blind spot!
  - Familiar for drivers (car experience)
  - Drivers expect backward information next to mirrors
  - **Benefit of 23%** regarding injury crashes (CICCHINO, 2017)





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## Conclusions

- Not disturbing (robustness in case of false positives)!
- Well informing (in use case)!
  - Perception increases when gaze turned!
- Information location (e.g. at A-pillar) equivalent with hazard location!
  - Information is at the right place at the right time!
- Use of mirrors is encouraged!
- Overall: Good support in complex situations!



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**Thank you for your attention!**

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